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BLOOD SUBSTITUTES AND THEIR USE AT MILITARY MEDICAL INSTITUTIONS

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[The following is the full text of a published review of Professor P. L. Sel'tsovskiy's book, "Krovozamenyayushchiye Rastvory i Ikh Primeneniye v Voyenno—Lechebnykh Uchrezhdeniyakh" (Blood Substitutes and Their Use at Military Medical Institutions), Library of the Military Physician, Moscow, 1952]

In the preface of the book under review P. L. Sel'tsovskiy justly states that the problem of blood substitute solutions was very important during the war. It does not lose its significance in peace time, because solutions of this type are used in everyday therapy.

Sel'tsovskiy also says that none of the solutions that have been proposed forms a [complete and perfect] substitute for blood. For that reason he insists that the generally accepted name of "blood substitutes" should not be used. Sel'tsovskiy refers to the solutions in question as "blood replacing solutions."

I am of the opinion that this constant argument in regard to the correct name for blood substitutes is of no fundamental importance. It is quite clear that there is no solution which completely corresponds to blood. It is doubtful that such a solution can be created at all. However, this does not mean that the therapeutic effect of artificial solutions is always inferior to that of blood itself. In some respects and under certain conditions such solutions may be more useful than blood. For that reason it is incorrect to call blood substitutes "blood replacing solutions" and to imply that the word "replacing" denotes something secondary and inferior.

The book under review consists of 80 pages and is subdivided into nine chapters.

In the first chapter, which is a brief bibliographic review, all stages of the preceding development in the field of preparation and application of therapeutic solutions are outlined in detail. The author quite correctly emphasizes the priority of native scientists in this field.

The second chapter is devoted to the classification of blood substitute solutions. The author subdivides all such solutions into two groups: (1) natural solutions, including those of all basic components of human blood; and (2) artificial solutions, which comprise all other solutions.

At the present time this classification cannot be regarded as perfect.

A special place among blood substitutes is occupied by colloidal solutions. In Sel'tsovskiy's classification sufficient attention is not given to these solutions.

In the third chapter the problems of setting up the equipment and of preparing the basic ingredients that enter into various types of solutions is discussed in detail. On the basis of his own extensive experience, the author gives clear and exhaustive directions in regard to all details involved in the preparation of the equipment for use, emphasizing quite correctly the importance of observing even minor precautions. The failure to observe these precautions sometimes interferes with the technique of the process. Procedures for testing distilled water and solutions are described in detail. These procedures are of great importance for practical physicians.

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In the fourth chapter the method of introducing the blood substitute solutions is described. Here the reader finds practical and useful advice given by a prominent specialist in this field. However, the categorical condition set by the author that all blood substitute solutions, even solutions of glucose, must be introduced exclusively by the intravenous path is perplexing. It is not true that one may use only physiological salt solution for subcutaneous injections. It is an indispensable condition that every blood substitute ought to be suitable not only for intravenous injection, but also for subcutaneous administration. It is recognized at present that one of the principal shortcomings of colloidal solutions, such as species-nonspecific serum, is the fact that they cannot be injected subcutaneously.

The author's argument to the effect that there is danger of the development of phlegmons at the sites of injection, by reason of the introduction of a nutritive medium for bacteria into the subcutaneous cellular tissue, cannot be regarded as valid.

One of the most useful parts of the book is Chapter 5, in which the indications for the injection of blood substitute solutions are discussed. The information given by the author in regard to the determination of the doses of solutions to be administered and of blood to be injected, depending upon the height of the blood pressure, is very useful.

The next chapter deals with reactions and complications which occur following the injection of blood substitutes. Familiarity with this subject matter will be of use to every practicing physician, because knowledge of this type will contribute to a lowering of the number of complications and reactions.

The problem of natural blood substitutes is discussed in the book very briefly. This subject is covered on 4.5 pages. The inclusion of acute hepatites and of hemolytic jaundice in the list of contraindications to plasma transfusion is open to argument.

The most extensive chapter of the book is Chapter 8, which contains a description of methods and rules for the application of artificial blood solutions. Fifteen solutions proposed by native scientists are discussed in detail. Because of its superior coverage of information on all solutions, Sel'tsovskiy's book is an excellent manual on blood substitutes. The table listing blood substitute solutions has been compiled very aptly. In this table the reader will find the most essential data on every blood substitute solution.

In the last chapter the basic information on species-nonspecific serum is given. In the light of the facts established recently, it would have been advisable to evaluate this serum in a more critical manner and indicate not only its advantages, but also its shortcomings.

In conclusion the author states with justice that the great number of blood substitute solutions that have been proposed must not frighten physicians. For practical purposes it is best to have not just one blood substitute but several, because the application of different solutions may be indicated by the state of the patient and the nature of the disease.

A detailed study of Sel'tsovskiy's book demonstrates that this is a work which is very useful for practical physicians. The book will be read with pleasure and profit by every physician.

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